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MIDDLE WILLAMETTE BASIN (OREGON). PRELIMINARY ECONOMIC RECONNAISSANCE AND ESTIMATE OF GROWTH 1960-2010

Public Health Service
Portland, Oregon

August 1962

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WORKING PAPER NO. 27

COLUMBIA RIVER BASIN PROJECT
For Water Supply and Water Quality Management

MIDDLE WILLAMETTE BASIN (OREGON)
PRELIMINARY ECONOMIC RECONNAISSANCE AND ESTIMATE OF GROWTH, 1960-2010

DATE: August 10, 1962

Prepared by EES

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U. S. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE
Public Health Service
Region IX

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Room 570 Pittock Block
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This working paper contains preliminary data and information primarily intended for internal use by the Columbia River Basin Project staff and cooperating agencies. The material presented in this paper has not been fully evaluated and should not be considered as final.

MIDDLE WILLAMETTE BASIN (OREGON)
PRELIMINARY ECONOMIC RECONNAISSANCE AND ESTIMATE OF GROWTH, 1960-2010

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Prepared by: Economic Studies Group
Water Supply and Pollution Control Program, Pacific Northwest
August 1962

I

MIDDLE WILLAMETTE BASIN (OREGON)
PRELIMINARY ECONOMIC RECONNAISSANCE
AND ESTIMATE OF GROWTH, 1960-2010

INTRODUCTION

Purpose of This Analysis

This analysis is intended to provide a preliminary estimate of the economic potentials and anticipated growth of the subject area.

Definition of the Area

The Willamette River Basin divides conveniently into three parts: (1) the Lower Portion, comprising the Portland Metropolitan Area (Clackamas, Multnomah, and Washington Counties); (2) the Middle Portion, comprising Benton, Linn, Marion, Polk, and Yamhill Counties; and (3) the Upper Portion, comprising Lane County. This report is an analysis of the economy of the Middle Portion.

Physically, the western part of Benton County, comprising the Alsea River drainage, lies outside the Willamette River Basin, draining directly into the ocean. However, because basic statistics are available on a county basis, all of Benton County is included in the study area. Since the Alsea portion of Benton County comprises less than one-half of one per cent of Middle Willamette Basin population, no significant distortion is involved. With this exception, the boundaries of the five-county area conform approximately to the Willamette Basin boundaries.

Study Period

The study period is the 50-year period 1960-2010, with an interim point at 1985.

Limitations of This Analysis

Two limitations apply to this study. The first is that it is intended only as a preliminary estimate of the outlook for the subject area's growth. Subsequently, in connection with the Columbia River Basin Project for Water Supply and Water Quality Management, an analysis will be made on an industry-by-industry basis of the growth potential in the various sub-basins. At that time, this preliminary estimate will be reviewed, and revised if necessary.

The second limitation is that this study is intended for use particularly in assessing future water needs. Emphasis has been placed on the analysis of those industries which make heavy demands upon the water resource. Other industries have been considered only insofar as they may have a significant effect on future population. For this reason, this study is not submitted as a detailed industrial forecast.

PRESENT ECONOMIC BASE

Population

Total population in the five counties of the Middle Willamette Basin, as of April 1960, was 278,000. Table I shows how this population was distributed among the cities and sub-basins of the Middle Basin in 1960, and also the comparable figures for 1950. The Middle Basin has been divided among 15 "sub-basins." One of these is the "Salem Urban Area," which includes not only the City of Salem but also the built-up, but as yet unincorporated, areas around it. The 1950 figure for the "Salem Urban Area" is an estimate of the population within the same boundaries used for the 1960 definition.

Table I

POPULATION, BY SUB-BASIN AND INCORPORATED PLACES, MIDDLE WILLAMETTE BASIN[a]/

Sub-Basin or Incorporated Place	Population of Incorporated Place 1950	Population of Incorporated Place 1960	Estimated Pop'n. of Sub-Basin, Nearest thousand 1950	Estimated Pop'n. of Sub-Basin, Nearest thousand 1960
SALEM URBAN AREA[b]/			61	77
Salem city	43,140	49,142		
WILLAMETTE MAIN STEM			57	73
Albany	10,115	12,926		
Corvallis	16,207	20,669		
Dundee	308	318		
Harrisburg	862	939		
Independence	1,987	1,930		
Monmouth	1,956	2,229		
Newberg	3,946	4,204		
St. Paul	226	254		
YAMHILL			28	26
Amity	672	620		
Carlton	1,081	959		
Dayton	719	673		
Lafayette	662	553		
McMinnville	6,635	7,656		
Sheridan	1,922	1,763		
Willamina	1,082	960		
Yamhill	539	407		
PUDDING[c]/			25	25
Aurora	242	274		
Donald	187	201		
Gervais	457	438		
Hubbard	493	526		
Mt. Angel	1,315	1,428		
Scotts Mills	217	155		
Silverton	3,146	3,081		
Woodburn	2,395	3,120		
NORTH SANTIAM			10	9
Detroit	274	206		
Gates	422	189		
Idanha	442	295		
Lyons	400[d]/	463		
Mill City	1,792	1,289		
Stayton	1,507	2,108		

(continued)

Table I (cont'd)

Sub-Basin or Incorporated Place	Population of Incorporated Place 1950	Population of Incorporated Place 1960	Estimated Pop'n. of Sub-Basin, Nearest thousand 1950	Estimated Pop'n. of Sub-Basin, Nearest thousand 1960
SOUTH SANTIAM			25	26
Lebanon	5,873	5,858		
Scio	448	441		
Sweet Home	3,603	3,353		
Waterloo	180	151		
SANTIAM, MAIN STEM BELOW FORKS			2	2
Jefferson	636	716		
MILL CREEK			5	6
Aumsville	281	300		
Sublimity	367	490		
Turner	610	770		
RICKREALL			8	8
Dallas	4,793	5,072		
LUCKIAMUTE			6	5
Falls City	853	653		
MARYS			7	8
Philomath	1,289	1,359		
CALAPOOYA			8	8
Brownsville	1,175	875		
Sodaville	157	145		
MUDDY CREEK[c/]			2	1.5
Halsey	388	404		
LONG TOM[c/]			1	1
Monroe	362	374		
TUALATIN[c/]			1	1
TOTAL, MIDDLE WILLAMETTE RIVER BASIN DRAINAGE			246	277
ALSEA RIVER DRAINAGE (COASTAL), BENTON COUNTY			1	1
TOTAL, 5 COUNTIES OF MIDDLE BASIN			247	278

a/ Includes Benton, Linn, Marion, Polk and Yamhill Counties.
b/ Defined as the area included within the following 1960 Census County Divisions: Four Corners, Hayesville, Keizer, Salem, and Salem Heights.
c/ These figures include only that portion of the basin within the 5-county Middle Willamette Basin area.
d/ Unincorporated in 1950. Figure shown is an estimate.

Industry

The economy of the Middle Basin is more diversified than that of Lane County. Lumber and wood products manufacturing employment constituted 55 per cent of the total labor force in the Middle Basin in 1960, as compared to 80 per cent in Lane County. Ten per cent of the Middle Basin labor force is in agriculture, compared to about three per cent in Lane County. Table II shows employment, by industry, in the Middle Basin in 1960, with comparable figures for 1950, and the percentage distribution of the total labor force.

Table II

EMPLOYMENT, BY INDUSTRY, MIDDLE WILLAMETTE BASIN, 1950 and 1960[a/]

Industry	Employment, nearest hundred 1950	1960	Change in Employment, 1950-1960, hundreds	Distribution of Employment, per cent[b/] 1950	1960
Total Labor Force	941	1,014	+73	100.0	100.0
Military	2	6	+ 4	.2	.6
Unemployed	61	68	+ 7	6.5	6.7
Industry not reported	12	21	+ 9	1.3	2.1
Classifiable employed civilian labor force	866	919	+53	92.0	90.6
Agriculture	165	102	-63	17.5	10.1
Forestry and fisheries	2	5	+ 3	.2	.5
Mining	3	2	- 1	.3	.2
Manufacturing, total	199	202	+ 3	21.2	19.9
Lumber, wood products	136	110	-26	14.5	10.9
Primary metals	1	7	+ 6	.1	.7
Fabricated metals	1	3	+ 2	.1	.3
Machinery, incl. electric	4	10	+ 6	.5	1.0
All other durables	3	7	+ 4	.3	.7
Food and kindred	23	30	+ 7	2.4	2.9
Textiles and apparel	4	3	- 1	.5	.3
Printing and publishing	11	14	+ 3	1.1	1.4
Pulp and paper	10	14	+ 4	1.0	1.3
Other non-durables and n.e.c.	6	4	- 2	.7	.4
Construction	64	63	- 1	6.8	6.2
Education, government	51	79	+28	5.4	7.8
Education, non-government	8	15	+ 7	.9	1.5
Public administration	46	65	+19	4.8	6.4
All other services	328	386	+58	34.9	38.0

a/ Includes entire labor force of Benton, Linn, Marion, Polk and Yamhill Counties. Since employment figures are not available on a less-than-county basis, the Alsea (coastal drainage) portion of Benton County has not been excluded. However, the Alsea portion's population is less than 0.3% of total 5-county population, so that no significant distortion is introduced.

b/ Based on unrounded figures.

An indication of the economic base of the Middle Basin, that is, the type and degree of specialization in its economy, can be drawn from a comparison of the distribution of employment there with the distribution in the Portland Region as a whole. This is shown in Table III. Like the Portland Region, the Middle Basin has a high percentage of total manufacturing employment in lumber and wood products, even though the concentration is less than in the more highly specialized economy of Lane County. The Middle Basin also has some specialization in food processing, with 2.9 per cent of its labor force in that industry, as compared to 2.6 per cent in the Portland Region as a whole. Aside from these two manufacturing activities (lumber and wood products and food processing), the economic base of the Middle Basin depends significantly on two service industries--education and public administration. The concentration of employment in educational services is due to the location within the Middle Basin of Oregon State University, at Corvallis; Willamette University, at Salem; and Oregon College of Education, at Monmouth. The concentration of employment in public administration is due to the location of the state capital at Salem. In addition to lumber and wood products and food manufacturing and education and public administration, agriculture is an important part of the economic base of the Middle Basin.

Table III
LABOR FORCE DISTRIBUTION, BY INDUSTRY
MIDDLE WILLAMETTE BASIN AND PORTLAND REGION, APRIL 1960

Industry	Middle Willamette Basin %	Portland Region %
Total Labor Force	100.0	100.0
Military	.6	.8
Unemployed	6.7	6.0
Industry not reported	2.1	2.4
Classifiable employed civilian labor force	90.6	90.8
Agriculture	10.1	6.6
Forestry and fisheries	.5	.6
Mining	.2	.2
Manufacturing, total	19.9	22.9
Lumber, wood products	10.9	11.1
Primary metals	.7	.9
Fabricated metals	.3	.7
Machinery, incl. electric	1.0	1.6
All other durables	.7	1.5
Food and kindred	2.9	2.6
Textiles and apparel	.3	.9
Printing and publishing	1.4	1.3
Pulp and paper	1.3	1.7
Other non-durables and n.e.c.	.4	.6
Construction	6.2	5.9
Education, government	7.8	4.9
Education, non-government	1.5	1.0
Public Administration	6.4	4.4
All other services	38.0	44.3

Source: U.S. Census of Population, April 1960

Agricultural Land Use

Table IV shows how the land in farms in the Middle Basin was divided among the various uses in 1954 and 1959. The type of use employing the greatest number of acres is harvested cropland. Total land in farms declined slightly during the five-year period from 1954 to 1959.

Table IV
AGRICULTURAL LAND USE, MIDDLE WILLAMETTE BASIN, 1954 and 1959[a/]
Thousands of Acres

Type of Use	1954	1959
Land in farms, total	1602	1540
Cropland harvested	699	679
Cropland in fallow, etc.	65	97
Land used for pasture:		
Cropland used for pasture	129	117
Woodland used for pasture	378	271
Pasture land	140	171
Woodland	107	128
Other (roads, house lots, etc.)	84	77
Irrigated acres (included in above uses)	91	100

a/ Includes all of Benton, Linn, Marion, Polk and Yamhill Counties.

Source: U.S. Census of Agriculture, 1959

The types of crops raised on the "cropland harvested" acres in 1959 are shown in Table V.

Table V
ACRES OF CROPLAND, BY TYPE OF CROP, MIDDLE WILLAMETTE BASIN, 1959[a/]

Type of Crop	Acres, Thousands
Grains	247
Field seeds	248
Hay	83
Corn for feed	16
Sweet corn	12
Mint for oil	10
Beans (snap)	7
Potatoes	2
Broccoli	1
Dry onions	1
Carrots	1
Hops	4
Berries	11
Orchards	34
Misc. vegetables and other crops	2
Total, Cropland harvested	679

a/ Includes all of Benton, Linn, Marion, Polk and Yamhill Counties.

Source: U.S. Census of Agriculture, 1959

ESTIMATED FUTURE GROWTH

Factors Influencing Future Growth

Future growth in the Middle Willamette Basin is likely to be built upon the following factors:

(1) Agricultural production is expected to increase, due to increased irrigation and increased productivity, and this will provide the resources for an increase in food processing manufacturing.

(2) More complete use can be made of the timber resource. While it is not anticipated that the total timber harvest will increase, diversification of secondary manufacturing can increase the value of the products and also offset declines in employment that might otherwise occur due to rising labor productivity. It is estimated that wood resources will permit expansion of pulp and paper capacity to 1,100 tons per day by 1985 and 1,750 tons per day by 2010. Capacity in 1960 was 650 tons per day.

(3) Education and public administration employment are expected to grow at a somewhat faster rate than the population of the state during 1960-85 and at about the same rate as state population during 1985-2010.

(4) The nucleus of a primary metals industry is well established at Albany and it is expected that this industry will grow in the future.

(5) As population and the local and regional markets increase, it is expected that diversified "all other" manufacturing will increase during the study period. This category increased 4.2 per cent per year in employment during the period 1950-60 and it is assumed that that rate will continue during the study period.

Future Employment

On the basis of the preceding assumptions, Table VI shows an illustrative distribution of future employment, by industry, in the Middle Basin. It should be emphasized that these are somewhat hypothetical figures, and are presented in order to show how the labor force would grow if the changes assumed do occur.

Table VI
ILLUSTRATIVE DISTRIBUTION OF FUTURE EMPLOYMENT, BY INDUSTRY, MIDDLE WILLAMETTE BASIN

Industry	Employment, thousands 1950	1960	1985	2010	Basis for Projection
Agriculture	16.5	10.2	10	10	No change in number
Forestry, fish., mining	.5	.7	2	4	1950-60 rate--3.4%/yr.
Manufacturing					
Lumber, wood products	13.6	11.0	11	11	No change in number
Primary metals	.1	.7	2	4	1950-60incr.--+600/dec.
Food and kindred	2.3	3.0	6	11	1950-60 rate--2.7%/yr.
Printing and publishing	1.1	1.4	3	5	1950-60 rate--2.5%/yr.
Pulp, paper & allied	1.0	1.4	2	3	Limits of resources
All other manufacturing	1.8	2.7	8	21	1950-60 rate--4.2%/yr.
TOTAL MANUFACTURING	19.9	20.2	32	55	Composite of above
Education and Public Admin.	10.5	15.9	40	68	For 1960-85, 3.7%=rate of growth in this group in U.S. during 1950-60; for 1985-2010, 2.2%=projected rate of growth in Oregon state pop.
Total, "Basic" industries	47.4	47.0	84	137	Composite of above
Construction as % of Basic	13%	13%	13%	13%	Same ratio as in '50 and '60
Construction, employment	6.4	6.3	11	18	
Total, Construction + Basic	53.8	53.3	95	155	
All other services as % of Construction + Basic	61%	72%	92%	118%	Rate of change in this ratio in U.S. during 1950-60, i.e.,1.0%/yr.
All other Services, Employed	32.8	38.6	87	183	
TOTAL, EMPLOYED CIVILIAN LABOR FORCE	86.6	91.9	182	338	
Unemployed as % of Emp.C.L.F.	7.0%	7.4%	5.9%	5.9%	Same as US rate in '60
Unemployed, thousands	6.1	6.8	11	20	
Military, thousands	.2	.6	2	3	1950-60incr.--+400/dec.
Industry not reported as % of Employed Civilian L.F.	1.4%	2.3%	1.7%	1.7%	Ave.ratio for '50 & '60
Industry not reported, thous.	1.2	2.1	3	6	
TOTAL LABOR FORCE	94.1	101.4	198	367	

On the basis of existing information, it is difficult to anticipate the future composition of the labor force of the Middle Basin in more detail than that given in Table VI. However, as an indication of where growth might be expected to occur, the distribution of the labor force in the Middle Basin in 1960 is compared with that in the Lower Willamette Basin, the Shenandoah Valley, and the United States as a whole, in Table VII. The Shenandoah was selected as being a valley with comparable dimensions in a more mature area. While it should not be assumed that the employment distribution in a relatively small area such as the Middle Willamette Basin will ever be the same as the distribution in any other discrete area or in the U.S. as a whole, it is nevertheless noteworthy that employment in the Middle Willamette Basin is far below proportionate employment in the U.S. in the following categories: all durable goods manufacturing except lumber and wood products; textiles and apparel and chemical manufacturing; and military.

Table VII
COMPARATIVE DISTRIBUTION OF LABOR FORCE, BY INDUSTRY, APRIL 1960
(Per cent of Total Labor Force)

Industry	Middle Willamette Basin a/	Lower Willamette Basin b/	Shenandoah Valley c/	United States
Agriculture	10.1	3.0	15.8	6.1
Forestry, fish., mining	.7	.4	.8	1.0
Manufacturing, Total	19.9	19.6	27.7	25.1
Lumber, wood products	10.9	3.3	2.3	1.6
Primary metals	.7	1.3	.2	1.8
Fabricated metals	.3	1.4	.8	1.8
Machinery, non-electric	.7	1.6	.8	2.2
Electric machinery	.3	1.4	.8	2.1
Other durables d/	.7	2.5	2.2	4.5
Food and kindred	2.9	2.8	4.6	2.6
Textiles	.2	.7	2.2	1.4
Apparel and fab. textiles	.1	.9	4.5	1.7
Printing and publishing	1.4	1.6	.8	1.7
Chemicals	.1	.5	7.0	1.2
Other non-dur. and n.e.c. f/	1.6 e/	1.6 e/	1.3	2.5
Construction	6.2	5.9	8.1	5.5
Services g/	53.7	65.6	42.6	54.8
Emp. Civilian Labor Force	92.7	94.5	95.0	92.5
Unemployed	6.7	5.0	4.8	5.0
Military	.6	.5	.2	2.5
Total Labor Force	100.0	100.0	100.0	100.0

a/ Includes all of Benton, Linn, Marion, Polk and Yamhill Counties.
b/ Includes all of Clackamas, Multnomah and Washington Counties.
c/ Includes all of Augusta, Clarke, Frederick, Page, Rockingham, Shenandoah and Warren Counties.
d/ Includes motor vehicles and equipment; other transportation equipment, including ship building and repair; cement, pottery, glass, concrete, gypsum, plaster, stone, and structural clay and their products; professional and photographic equipment and supplies; and watches and clocks.
e/ Included in the 1.6% in the Middle Willamette Basin are 1.3% in pulp and paper. Included in the 1.6% in the Lower Willamette Basin are 1.3% in pulp and paper.
f/ Includes pulp and paper and their products, petroleum refining, footwear, and petroleum, coal, tobacco, rubber and leather products. Also in this total is the "not elsewhere classified" manufacturing, a small miscellaneous category.
g/ Includes "industry not reported" category, representing about 2 or 3 per cent of the labor force.

Future Population

Two methods were used to arrive at an estimate of Middle Willamette Basin population in 1985 and 2010. One method was to allocate to the various basins of Oregon the population forecast for the state in terms of national population trends, assuming that past trends in relative growth and in resource development would continue. The other method was to examine the growth trends within the Middle Basin, including the industries basic to that area and the relationships between the basic and service industries in the Middle Basin, and to extend those trends into the future. Both of these methods yielded approximately the same result, which suggests not so much that these figures are reliable forecasts of future population as that they are reasonable figures to use for design purposes. The figures are 530,000 for 1985 and 980,000 for 2010. In using the first method of estimating, mentioned above, it was assumed that Oregon population would be 3.05 million in 1985 and 5.26 million in 2010. In using the second method of estimating, it was assumed that the labor force, as projected in Table VI, would represent 37.4 per cent of the population, the average ratio for the years 1940, 1950 and 1960.

An estimated allocation of Middle Basin population among the various sub-basins is necessary for design purposes. Predictions of future population of such a small area as a sub-basin could be made with more confidence after detailed economic base studies of the areas concerned. Such studies are not available at this time. However, an illustrative and hypothetical distribution of population which may be adequate for certain design purposes and which is based on what are regarded as reasonable assumptions is given in Table VIII. The assumptions underlying this table are as follows:

1. Inasmuch as the projected rate of increase for the entire Middle Basin during the period 1960-2010 is about twice the growth rate during 1950-60, it is assumed that all parts of the Middle Basin will participate to some extent in the population growth. However, it is assumed that those sub-basins which grew more rapidly than others during 1950-60 will continue to have above-average growth, and that those which increased at a lower-than-average rate or declined in population will continue to lag behind the Middle Basin average rate of growth.

2. Because of the increased rate of growth projected for the entire Basin, it is assumed that sub-basins which declined in population during 1950-60 will not have a further population decline but will stabilize at about the 1960 level during the 1960-70 decade and then begin to participate in the Basin's over-all growth. If it is assumed that growth in these areas after 1970 will be at about half the rate for the entire Middle Basin, the growth rate for 1960-85 would average 0.8% per year and for 1985-2010 1.2% per year. These rates have been used in Table VIII for the Yamhill, North Santiam, Luckiamute and Muddy Creek sub-basins, which experienced a population decline during 1950-60.

3. It is assumed that those sub-basins which had no population change or which grew at a rate of less than 0.5% per year during 1950-60 will grow during 1960-2010 at a rate equal to half the Basin average, 1.3% per year during 1960-85 and 1.2% during 1985-2010. This rate has been used in Table VIII for the Pudding, South Santiam, Santiam Main Stem, Rickreall, Calapooya, Long Tom, Tualatin and Alsea sub-basins.

4. It is assumed that those sub-basins which grew during 1950-60 at rates above the 1950-60 Basin average but substantially below the Basin average rate projected for 1960-2010 will increase their rates of growth sufficiently to equal the rate projected for the Basin as a whole, 2.6% for 1960-85 and 2.5% for 1985-2010. These rates have been used in Table VIII for Mill Creek and Marys sub-basins.

5. The remainder of projected Middle Basin population has been assigned to the Salem Urban Area and the Willamette Main Stem. The Salem Urban Area had 77 thousand population in 1960, compared with 73 thousand in the area defined as the Willamette Main Stem. However, the latter grew slightly more rapidly than the Salem Urban Area during 1950-60. It is assumed that that relative trend will continue and that by 2010 the populations of the two areas will be about equal.

In Table VIII, the estimated 1985 and 2010 population of each sub-basin is given not only in thousands of population but also in terms of the growth factor which that population would represent over the 1960 population.

Until detailed economic studies are made of specific cities within the Middle Basin, it may also be assumed that the cities in each sub-basin will grow at about the same rate as the sub-basin in which they are located. On this basis, the growth factors in Table VIII may also be applied to the individual cities in each sub-basin.

Table VIII
ILLUSTRATIVE DISTRIBUTION OF ESTIMATED FUTURE MIDDLE WILLAMETTE BASIN POPULATION; GROWTH FACTORS BY SUB-BASIN, 1985 and 2010

Sub-Basin	1985 Population, thousands	1985 Multiple of 1960 Population	2010 Population, thousands	2010 Multiple of 1960 Population
Salem Urban Area[a/]	178	2.3	363	4.7
Willamette Main Stem	174	2.4	364	5.0
Yamhill	32	1.2	43	1.6
Pudding[b/]	35	1.4	47	1.9
North Santiam	11	1.2	15	1.6
South Santiam	36	1.4	49	1.9
Santiam, main stem	3	1.5	4	2.0
Mill Creek	11	1.8	20	3.3
Rickreall	11	1.4	15	1.9
Luckiamute	6	1.2	8	1.6
Marys	15	1.9	28	3.5
Calapooya	11	1.4	15	1.9
Muddy Creek[b/]	2	1.3	3	2.0
Long Tom[b/]	1.5	1.5	2	2.0
Tualatin[b/]	1.5	1.5	2	2.0
Alsea	1.5	1.5	2	2.0

a/ For definition, see footnote to Table I.
b/ These figures include only the portion of the sub-basin within the boundaries of the 5-county area defined as the Middle Willamette Basin.